

9. $\lim_{x \rightarrow \infty} \frac{1 - \cos x}{x^2} = 0$ or:

$-1 \leq -\cos x \leq 1$
 add 1 $0 \leq 1 - \cos x \leq 2$
 divide by x^2 $0 \leq \frac{1 - \cos x}{x^2} \leq \frac{2}{x^2}$

$-\frac{2}{x^2} \leq \frac{1 - \cos x}{x^2} \leq \frac{2}{x^2}$

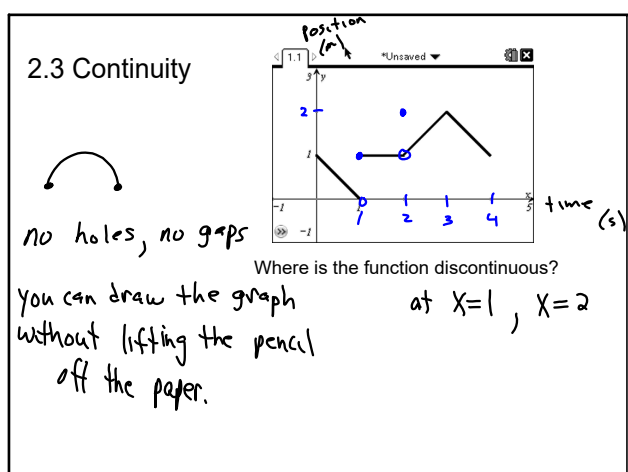
$\lim_{x \rightarrow \infty} \frac{2}{x^2} = 0$ $\lim_{x \rightarrow \infty} -\frac{2}{x^2} = 0$

Aug 29-9:51 AM

45. $y = e^x - 2x$

right ebm $y = e^x$ left ebm $y = -2x$

Aug 29-10:09 AM



Aug 30-7:43 PM

definition of continuity at a point p 79

$f(x)$ continuous at $x=c$ if

$\lim_{x \rightarrow c} f(x) = f(c)$
 limit exists = function exists


① ③ ②

definition of continuity on an interval

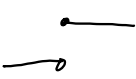
Sep 3-7:36 AM

type of discontinuities

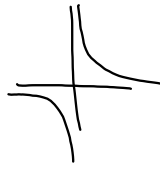
hole (removable discontinuity)



jump discontinuity

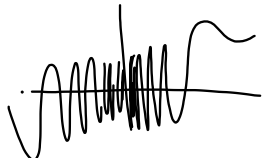


infinite discontinuity



oscillating discontinuity

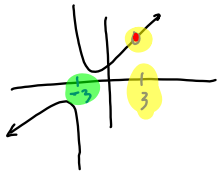
$y = \sin(\frac{1}{x})$



Sep 3-7:36 AM

p81 exploration 1 removing a discontinuity

$f(x) = \frac{x^3 - 7x - 6}{x^2 - 9}$



discont at $x = 3$

$x = -3$

$f(x) = \frac{(x-3)(x+1)(x+2)}{(x-3)(x+3)}$

$g(x) = \begin{cases} \frac{x^2 - 7x - 6}{x^2 - 9} & x \neq 3 \\ k = \frac{20}{6} & x = 3 \end{cases}$

plug $x=3$ into simplified version

Sep 3-7:39 AM

continuous on the domain

intermediate value theorem for continuous functions

Sep 3-7:38 AM

Sep 6-7:28 AM